

### **REMARKS**

Claims 1-31 are pending in this application. Claim 1 has been amended. It is respectfully submitted that no new matter has been added.

The Examiner's reconsideration of the rejection is respectfully requested in view of the above amendment and the following remarks.

#### **Rejections under 35 U.S.C § 103:**

I. Claims 1-4, 7-9, 17, 20-22, 25-27 and 31 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (U.S. 6,052, 173) in view of Ohtsuki et al. (U.S. 6,078,598) and further in view of Nishi et al. (US2004/0223132).

Amended claim 1 and claim 17 recite, *inter alia*, a wavelength converter which directly converts a wavelength of the source light of about 315nm to about 400nm to a wavelength of about 193 nm. Claim 31 recites, *inter alia*, a wavelength converter which directly converts a wavelength of the source light to a wavelength corresponding to the highest absorptivity of a photoacid generator of resist coated on the wafer. Applicants respectfully submit that that neither Miura, Ohtsuki, Nishi, nor any combination thereof teaches or suggests the above-claimed features.

The Examiner acknowledges that "Miura does not disclose a light source with wavelength of 315nm to about 400nm and a wavelength converter for converting the wavelength of the source light to wavelength of about 193nm". This follows that Miura does not disclose a wavelength converter which directly converts a wavelength of the source light of about 315nm to about 400nm to a wavelength of about 193 nm. For this element, the Office Action relies on Ohtsuki and Nishi.

The Examiner states that “regarding directly converting the wavelength, Nishi discloses that the wavelength of a semiconductor laser is converted into ultraviolet light using a nonlinear optical crystal, and Ohtsuki discloses directly converting from 386nm into 193nm”. Applicants respectfully disagree.

Ohtsuki does not disclose or suggest a wavelength converter which directly converts a wavelength of the source light of about 315nm to about 400nm to a wavelength of about 193 nm. The cited portion of Ohtsuki reads:

The nonlinear optical crystals that can be used in this case are an LBO crystal ( $\text{LiB}_3\text{O}_5$ ), which converts light with a wavelength of 772 nm emitted from the alexandrite crystal laser medium 1 into light with a wavelength of 386 nm, and an SBBO crystal ( $\text{Sr}_2\text{Be}_2\text{B}_2\text{O}_7$ ), which converts the light with a wavelength of 386 nm emitted from the LBO crystal into light with a wavelength of 193 nm. (Ohtsuki, Col. 14, lines 18-25).

As such, Ohtsuki does not disclose or suggest a wavelength converter which directly converts a wavelength of the source light of about 315nm to about 400nm to a wavelength of about 193 nm. In contrast, Ohtsuki describes an optical element (2) which performs multiple conversion steps to convert a wavelength of 772nm into 386nm, and then into 193nm using at least two crystals (e.g., LBO crystal and SBBO crystal). In other words, the 386 nm wavelength is not a wavelength of the light source. In contrast, in Ohtsuki, the 772 nm wavelength is the wavelength of the light source. Accordingly, the optical element (2) in Ohtsuki does not directly convert the source light of about 315nm to about 400nm to a wavelength of about 193nm.

Nishi does not disclose or suggest a wavelength converter which directly converts a wavelength of the source light of about 315nm to about 400nm to a wavelength of about 193 nm. The cited portion of Nishi reads:

In addition, for example, as vacuum ultraviolet light other than the laser beams emitted from the above light sources, a harmonic wave may be used that is obtained by amplifying a single-wavelength laser beam in the infrared or visible range emitted by a DFB semiconductor laser or fiber laser, with a fiber amplifier doped with, for example, erbium (Er) (or both erbium and ytterbium (yb)), and by converting the wavelength into ultraviolet light using a nonlinear optical crystal. [Emphasis added].

However, Nishi discloses that the wavelength of a light source is amplified with a fiber amplifier and converted with a nonlinear optical crystal. As such, Nishi does not disclose a wavelength converter which directly converts a wavelength of the source light of about 315nm to about 400nm to a wavelength of about 193 nm. Further, the wavelength of the source light of Nishi is the infrared or visible range light source, not a wavelength of about 315nm to about 400nm.

Accordingly, even assuming, *arguendo*, that the references were combined, the combination does not disclose or suggest “a wavelength converter which directly converts a wavelength of the source light of about 315nm to about 400nm to a wavelength of about 193 nm.” Thus, claims 1, 17 and 31 are not rendered obvious by Miura in view of Ohtsuki and further in view of Nishi.

Furthermore, applicants respectfully disagree with the Examiner assertion that Miura discloses “a wavelength corresponds to the highest absorptivity of a photoacid generator of resist coated on the wafer (col. 1, lines 42-[44], where exposure light turns the resist)”. [Emphasis added].

The cited portion of Miura reads:

(2) The peripheral area of wafer is irradiated with exposure light as the wafer to which the resist has been applied is turned. [Emphasis added]. See Col. 1, lines 42-44 of Miura.

The Examiner misconstrues the cited portion of Miura. Miura discloses that it is the wafer which turns (or rotates), not the resist. Furthermore, Miura is completely silent

on “a wavelength corresponds to the highest absorptivity of a photoacid generator of resist”.

As claims 2-4 and 7-9 depend from claim 1, and claims 20-22 and 25-27 depend from claim 17, they are also not rendered obvious by Miura in view of Ohtsuki and further in view of Nishi for at least these reasons.

Accordingly, withdrawal of the obviousness rejections is respectfully requested.

II. Claims 5 and 23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. in view of Ohtsuki and Nishi and further in view of Tanaka et al. (US 5,811,211).

As stated above for claims 1 and 17, Miura, Ohtsuki and Nishi do not disclose or suggest a wavelength converter which directly converts a wavelength of the source light of about 315nm to about 400nm to a wavelength of about 193 nm, as recited in claims 1 and 17. Tanaka at the very least does not cure the above mentioned deficiency of Miura, Ohtsuki and Nishi with respect to the wavelength converter recited in claims 1 and 17.

As claims 5 and 23 depend from claims 1 and 17, respectively, these dependent claims are likewise patentable over Miura in view of Ohtsuki and Nishi and further in view of Tanaka.

Accordingly, withdrawal of the obviousness rejections is respectfully requested.

III. Claims 6, 10-14, 18-19 and 24 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (U.S. 6,052, 173) in view of Ohtsuki and Nishi and further in view of Yamamoto (US 4,905,037).

As stated above for claims 1 and 17, Miura, Ohtsuki and Nishi do not disclose or suggest a wavelength converter which directly converts a wavelength of the source light

of about 315nm to about 400nm to a wavelength of about 193 nm, as recited in claims 1 and 17. Yamamoto at the very least does not cure the above mentioned deficiency of Miura, Ohtsuki and Nishi with respect to the wavelength converter recited in claims 1 and 17.

As claims 6, 10-14, 18-19 and 24 depend from claims 1 and 17, respectively, these dependent claims are likewise patentable over Miura in view of Ohtsuki and Nishi and further in view of Yamamoto.

Accordingly, withdrawal of the obviousness rejections is respectfully requested.

IV. Claims 15-16 and 29-30 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (U.S. 6,052, 173) in view of Ohtsuki and Nishi and further in view of Minemoto et al. (US 5,381,429).


As stated above for claims 1 and 17, Miura, Ohtsuki and Nishi do not disclose or suggest a wavelength converter which directly converts a wavelength of the source light of about 315nm to about 400nm to a wavelength of about 193 nm, as recited in claims 1 and 17. Minemoto at the very least does not cure the above mentioned deficiency of Miura, Ohtsuki and Nishi with respect to the wavelength converter recited in claims 1 and 17.

As claims 15-16 and 29-30 depend from claims 1 and 17, respectively, these dependent claims are likewise patentable over Miura in view of Nishi and further in view of Minemoto.

Accordingly, withdrawal of the obviousness rejections is respectfully requested.

For the foregoing reasons, the present application, including claims 1-31, is believed to be in condition for allowance. The Examiner's early and favorable action is respectfully requested. The Examiner is invited to contact the undersigned if he has any questions or comments in this matter.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Scott Appelbaum", written over a horizontal line.

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